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PORTLAND ROADS BREAKWATER.

OBSERVATIONS
ON
MR. RENDELL'S PLAN FOR
AND
MR. JOHN HARVEY'S ADDRESS TO THE PUBLIC RESPECTING IT,

BY ALEXANDER LAMB,
THE ORIGINAL PROJECTOR.

"Aspice quid faciant commercia."—*Juv.*

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PORTLAND ROADS BREAKWATER.

The Times newspaper of the 27th of July last, in detailing the proceedings that took place at Portland on the preceding Wednesday, stated—"The construction of a Break-"water, so as to convert Portland Roads into a harbour of refuge, is not a new scheme. "It was first proposed by Mr. Harvey, of Weymouth;" and, "as planned by Mr. Rendell, "the eminent civil engineer, will shelter an area of 1822 acres from the only wind to "which it is now exposed." Such is the statement by *The Times*, which I would have corrected through their own columns, if they would have allowed it.

Mr. Rendell's own Report to the Admiralty, printed by Order of the House of Commons, is, "That the Breakwater will include 832 acres, having from seven to five fathoms "of water; 1,067 acres up to three-fathom line; 1,175 acres up to two-fathom line; and "1,374 acres up to low water: that, allowing three acres for each vessel of the largest "class, running in and taking up her berth, in rough weather, which is not more than "sufficient for safety to the other ships at anchor, there would be perfect shelter for "nearly 300 vessels of the largest class, and for 150 of the smaller class."

Mr. Rendell's Report surprised me very much; because the conversion of Portland Roads into a harbour was originally suggested by me, and not by Mr. Harvey; and according to my suggestion, the projected harbour contained an area of 3,607 acres, of which 2,270 acres were in five fathoms water and upwards, and these, in the judgment of Mr. Dessiou, hereafter-mentioned, were not more than sufficient, and, in the judgment of the first Lord Exmouth, not sufficient, for 60 sail of the line, consequently allowing upwards of 38 acres for each vessel.

I do not know whether Mr. Rendell was ever on board a ship of war of the largest class (I should think not); or whether he ever saw Plymouth Sound, or the papers relating to that Breakwater, ordered by the House of Commons to be printed in February, 1812; but, annexed to those papers is a Chart, shewing that the area for the anchorage of ships of war covered by the Breakwater there is 790A. 2R. 12P., in which Mr. Jackson, the Master attendant, placed only 36 sail of the line, allowing nearly 22 acres for each ship, in a harbour more sheltered than Portland Roads; while Mr. Rendell, in Portland Roads, allows only "three acres for each vessel of the largest class, running in and "taking up her berth in rough weather."

If Mr. Rendell will turn to Cocker, he will find that in a square of three acres, he cannot draw a circle within it having a larger diameter than $\overset{\text{ft.}}{361} : \overset{\text{in.}}{5} : \overset{\prime\prime}{6.8}$. Now, the gun-deck of the Caledonia is 208 ft. 4 in. by 54 ft. 9½ in., and consequently is upwards of a quarter of an acre.

Suppose a 74-gun ship, which measures from the aft side of her taffrail to the fore part of her stem, at least, 247 feet, at anchor in Portland Roads, with only 40 fathom of cable out, and she would frequently require 80 fathoms or upwards, but assume 40 only, she would, in swinging at her anchor, describe a circle, the diameter of which would be 974ft., and Mr. Rendell will find by Cocker, that the area of such a circle is upwards of 17 acres.

Has Mr. Rendell, the eminent Engineer of the *Times*, shewn himself to be a fit person to be entrusted with the execution of such a work as the Breakwater in Portland Roads, on which, under his guidance, large sums (for I see, on the 1st February, 1847, he asked for £200,000) of the people's money will be expended; the work, if executed according to his plan, being comparatively valueless?

Should any one ask why I take an interest in the Breakwater in Portland Roads, my answer is, It was originally suggested by me, and was not "first proposed by Mr. Harvey "of Weymouth." Whether there is much merit in originally suggesting a work so obviously useful, or not, I leave to the judgment of the public; but as I was at all the expense of bringing it forward, and have since expended considerable sums and devoted much time in laying it before, and urging, the several governments to carry it into effect, it is but fair to claim whatever credit, if any, belongs to the first idea of it; hence it is that I am induced to refute the statement of the *Times* "that it was first proposed by "Mr. Harvey of Weymouth," and also to expose the fallacies contained in a pamphlet of Mr. John Harvey, jun., the present Post-master at Weymouth, to which my attention was directed by an advertisement, intimating that subscriptions were making, in order to present him with a suitable memorial for his and his father's untiring exertions in bringing before successive governments and the public the necessity of a Breakwater at Portland. The subscribers, of course, know for what they are subscribing: with that I have nothing to do. What I complain of is, that the present Mr. Harvey, in his pamphlet and elsewhere, persists in claiming for his father, the original suggestion of a Breakwater in Portland Roads, to which he has no title. The facts are as follow:—

In 1812, the publication of the Report of Messrs Rennie & Whitbey to the Admiralty, and a paper of Mr. Bentham's, addressed to the Navy Board, respecting a Breakwater in Plymouth Sound, gave rise to considerable discussion on the subject of not only the projected Breakwater at Plymouth Sound, but of Breakwaters generally.

Being at Plymouth soon after the publication of these papers, I heard a great deal of discussion on both the proper position and best mode of constructing the Breakwater there; which, as planned by Messrs. Rennie & Whitbey, was violently opposed by many persons who, amongst other mischiefs, predicted the silting up of the sound.

Soon after my return from Plymouth, and while the Breakwater there, and the discussions on it, were fresh in my memory, I was called on by the late Christopher Idle, Esq., to accompany him to Weymouth, whither he was going as a candidate for a seat in Parliament, as one of its members. While there, after a fatiguing morning, he proposed a ride before dinner; I suggested one to Portland. We rode over part of the island, and stopping our horses on the top of Fern Hill, were contemplating the Bay from that point of the land which commands a view of Weymouth, or more properly, Melcombe Regis. Mr. Idle asked me whether he should give the Corporation £3,000 for the purpose of repairing the Pier at North Point, then in a dilapidated state? I said, "No: if you think of doing anything to benefit Weymouth, do that which will also benefit the country. Get a Breakwater, such as is now forming at Plymouth, run out from the shore here to the wreck of the Abergavenny, and then the Weymouthites will not want a Pier at North Point."

Mr. Idle considered the proposition preposterous, and the subject dropt; nor was it renewed till Mr. Idle had, by reflection and inquiry, satisfied himself of the desirableness of the measure, which afterwards became a subject of frequent discussion between us.

Mr. Idle having made up his mind on the subject, desired me in Aug. 1813, to institute inquiries as to the practicability of it, which I commenced by applying to the late Mr. Joseph Dessiou, the hydrographer, an old scientific and experienced master in the navy, and well acquainted with the English channel, from whom I received the answer marked A in the Appendix.

On the receipt of Mr. Dessiou's letter, I applied to the hydrographer at the Admiralty to know if they had a correct chart of Portland Roads, who, on being told the purpose for which I wanted it, said there was not one in existence on which reliance could be placed.

On the 29th of Aug. 1813, I sent down Mr. George Dodd, the civil engineer, to Weymouth, in order to ascertain the practicability of the measure.

Mr. Dodd's reports from Weymouth being favourable, Mr. Idle decided on bringing the subject before Parliament; and on the 8th of Sept. Joseph Hellyer, John Stone, Robert Stone, and George Andrews, all of Portland, Quarry-workers, being severally tenants of the Manor of Portland, entered into a contract with Edmund Henning, of Weymouth, Esquire, Banker, to whom Mr. Idle had given Mr. Dodd a letter of introduction, to supply, in consideration of constant employment at stipulated wages during the work, any quantity of unwrought cap or roach-stone free of charge, that should be required for the breakwater.

In this early stage of the business, Mr. Idle had not decided on the specific nature of his application; he, therefore, consulted Mr. Harrison, the parliamentary counsel, and brother to the Secretary of the Treasury, as to the best mode of proceeding, and under his advice, instructions were given to Mr. Dodd to prepare plans and sections of the intended work. And on the 11th and 14th of the same month notices were inserted in the London Gazette and local papers, that application would be made to Parliament for leave to bring in a Bill for constructing a Pier and Breakwater and forming a harbour in Portland Roads; and on the 5th of October the requisite notice was placed on the door of the Sessions House, at Bridport; plans and sections with estimates of the cost, were also lodged with the clerk of the peace, and in the Private Bill of Office.

Mr. Dodd was detained at Weymouth till the 23rd of September, and during his stay there had frequent interviews with Mr. John Harvey, who, as soon as Mr. Dodd had explained to him the object of his visit to Weymouth, entered into the scheme with great enthusiam, and gave Mr. Dodd much useful information respecting the locality.

On the 12th of October, I received from Mr. Dodd the Report marked B in the Appendix, which I forwarded to Mr. Idle; and he, in return, sent me the Report marked C in the Appendix.

Immediately after the receipt of Mr. Dodd's Report B, Mr. Idle applied to Lord Melville for an interview on the subject. Lord Melville appointed Thursday the 14th, on which day, Mr. Idle laid the Plans and Reports before his Lordship, who expressed himself favorable to the measure, and intimated it would be a good work to employ convicts on.

Encouraged by Lord Melville's favorable reception of the measure, and the late Admiral Bowen and many other able and experienced seamen having confirmed Mr. Dodd's and Mr. Watkins's Reports, Mr. Idle determined to proceed; but a correct Chart of the Bay being still wanted, he desired I would take Mr. Dessiou and Mr. Dodd with me and meet him at Weymouth. We arrived at Weymouth on the 29th October; and on the following day, Mr. Idle and Mr. Watkins arrived, as did likewise the late Messrs. Rennie and Whitbey, whom Mr. Idle had appointed to meet him there, in order to have their opinions on the subject.

Mr. Rennie and Mr. Whitbey, having examined the Reports and obtained from Mr. Dodd, Mr. Dessiou, and Mr. Watkins, all the information they required, inspected the locality, and ultimately recommended Mr. Idle to proceed.

Mr. Idle then decided on having a survey made of the Bay; and in pursuance of his orders, I hired a vessel from Mr. Richard Tizard for the purpose, in which Mr. Dessiou, Mr. Dodd, and Mr. Watkins proceeded to make the survey.

Mr. Harvey, professing to take a great intersst in the measure, and having shewn Mr. Dodd attention on his former visit, and given him some useful information, I permitted, at his request, a son of his to go on board the vessel while the survey was taken.

Mr. Idle, having been assured by Mr. Dessiou, Mr. Dodd, and Mr. Watkins, that there was no obstacle to the measure, left us on the 9th of November, and on the 10th, I paid Mr. Tizard for the use of his vessel, and returned to town.

On the 9th of December, I received from Mr. Dessiou the letter marked D in the Appendix.

Before Mr. Idle could apply for leave to bring in a bill to carry out the measure, which he expected would receive the support of Government, he had a slight attack of paralysis; in consequence of which the measure stood over to be pursued in the following session.

Mr. Idle, though still unwell, continued to be very anxious about the measure; and in anticipation of the session of 1814-15, he desired that the requisite notices and plans should be given and lodged, which was done early in September; but he never recovered sufficiently to proceed in the business: and, indeed, had he recovered, it is very doubtful whether he would have succeeded in inducing Government to sanction it; for I afterwards learned that the very first mention of it had alarmed the late Sir John Lowther Johnstone, and that it was secretly opposed by both the Corporation of Weymouth, and the Trustees of the infant Sir Frederick Johnstone.

I now request the reader's attention to Mr. Harvey, Junior's, address to the public, in the commencement of which stands—"Remarks on the subject of an Asylum Harbour "for Portland Roads, as projected by the late Mr. John Harvey, Seventh Edition, En- "tered at Stationers' Hall, 1848."

Mr. Harvey, Jun., at page 7, has some remarks respecting the proceeding of the French at Cherbourg, and on its advantages to them, and at page 9 proceeds as follows: "In order to counteract these important objects, *I* propose to render Portland Roads "complete and efficient, in every point of view, on the system adopted on the opposite "coast at Cherbourg, viz. by the construction of a Breakwater, as exhibited in the map."

At page 11, after speaking of the accomplishment of the work in a period of five years, he proceeds, "It may be asked How can this assertion be satisfactorily proved? "*I* answer, that the Island of Portland affords stones already quarried to be had *gratis*, "in any quantity," &c.; and again, "*I* will now endeavour to explain how it is that "stones in such immense quantities are to be obtained already prepared, &c."

And at page 16, "If any doubt should arise as to the practicability of this important "work, *I* would most persuasively invite," &c., using through the whole 16 pages the personal pronoun *I*.

If Mr. Harvey, Jun., means to convey to the public the idea, that his pamphlet from the beginning to the conclusion of page 16, is a reprint of his father's pamphlet (and he means that, or he is unintelligible), *it is a most impudent attempt at deception.* In 1814, Mr. Harvey, Sen., did publish a pamphlet, two copies of which now lie before me, and from it I shall make some extracts; Mr. Harvey, Sen., in his pamphlet, after some account of Cherbourg, says, "The advantages of the situation of Cherbourg to the "French nation are very considerable, as affording adequate protection to their own "shipping and the means of greatly annoying the English commerce in case of war.

"To counteract their objects in this point of view, *it is proposed* to improve the "Portland Roads, upon the plan adopted on the opposite coast by constructing a "Breakwater which should extend, from the north-east part of the island, two miles "and a quarter, by which a safe anchorage would be secured and a Roadstead formed "of about four square miles, twenty-one leagues north of Cherbourg.

"This Roadstead would be by far the best in the British Channel; and from its "central situation between Portsmouth and Plymouth, would form a complete counter- "action on the naval armaments at Cherbourg.

"It will cover the wreck of the Abergavenny, and at that point a vessel may clear "Portland (without making a tack) if urged to sea when the wind blows hard from the "south-east quarter. This necessary position can be better obtained by vessels when "working up under the lee of the Breakwater, than when exposed to the full effect of an "unobstructed sea, which they would have to contend with, if the Breakwater was of "less extension than what is here proposed.

"The Breakwater in Portland Roads may be finished within the space of five years. "Portland affords stones already quarried, which may be had gratis in any quantity. "The stone most proper for this work is the cap-stone, which is not of a marketable "quality for architectural purposes, it generally being of a hard, rough, shelly texture.

"The elevation of the quarries is more than 300 feet above the level of the sea, and "railways might be constructed on proper inclined planes to carry the stones to the "water side without the aid of either engines or horses, by which the expense of the "work would not exceed one-fourth of that in any other part of the known world.

"It may be proper to explain how stone in such immense quantity is to be had already "prepared, and fit for such a work. The reason is, that it is necessary, in working the "quarries, to remove, on an average, about fourteen feet thick of the upper or cap-stone "before they arrive at the layer or bed of the fine or marketable stone. This broken "cap-stone becomes an incumbrance.

"The perfecting of this work will afford more extended general advantages to the "country at large than any similar undertaking, from its situation between Portsmouth "and Plymouth in the event of stress of weather; there being no other port in which "ships can ride in safety; and affording withal a secure asylum to our merchant ships "in time of war as well as a naval station to watch the operations of the enemy on the "opposite coast.

"As the improvement of our sea ports is a national good (be the situation where it "may) it is matter of surprise that an object of so great a magnitude, in such a "situation, and at so small a distance from Cherbourg *should have so long been over-* "*looked*," &c.

Mr. Harvey then adverts to the wrecks of the Halsewell, East Indiaman; the fleets under the command of Admiral Christian, and the Abergavenny, East Indiaman, that sunk "on the very spot that *it is proposed* to terminate the end of the intended "Breakwater."

On comparing these extracts from the pamphlet of Mr. Harvey, Sen., with the reports of Mr. Dessiou, Mr. Dodd, and Mr. Watkins, in the Appendix, it is obvious that those reports and the information he obtained during his intercourse with those gentlemen and myself, was the foundation of his pamphlet as far as it respects Portland; he does not, like his son, in *his* pamphlet say, "*I* propose," &c.; Mr. Harvey, Sen., in his pamphlet says, "*it is* proposed to improve Portland Roads," &c.; and afterwards, "*it is* "matter of surprise that an object of so great a magnitude, in such a situation, and "at so small a distance from Cherbourg *should have so long been overlooked;*" it is evident the subject was then new to him, as I found it was to every one to whom it was mentioned, though all persons saw and generally appreciated its importance after having it pointed out to them. It is, however, due to the memory of Mr. Harvey, Sen., to request the reader's attention to the last paragraph in Mr. Dessiou's letter of the 9th of Dec. 1813, Appendix D, in which I fully concur; and I know that Mr. Harvey's information was useful to Mr. Dodd, as well as to Mr. Dessiou, though, while he was rendering them assistance, he was, as will be seen by the following letter, pursuing *an* object of his *own*.

"Weymouth, Sept. 30, 1813.

"Sir,—I was prevented the pleasure of writing, by favour of Mr. Dodd, not being "certain of the time of his departure.

"I have attended him, and rendered such assistance as he required and wished for; "and from the best judgment I can form at the present moment, I have no doubt what- "ever but his survey and representation will be such as to give a high satisfaction to you "and all the gentlemen concerned in this grand undertaking. Its practicability cannot "be for a moment doubted; and the resource for stone, with facilities in conveyance, "cannot, I think, be surpassed, if equalled in the world.

"I doubt not but a quantity of stone, sufficient for this undertaking, will be found "below the cliffs, which has been thrown away for ages past as waste; if more was "wanting, an inexhaustible store of the same description lies above the intended "railroad.

"The more I investigate, the more I approve, and so must, I think, every person that "visits Portland, and looks it over.

"I am using my best endeavours to make calculations, and complete drawings of the

" work, &c., which shall be at your service whenever you wish it ; and I beg leave to " assure you, that I have made up my mind to go most heartily into the concern, " whenever your friends may please to give an intimation to your obliged and devoted " humble servant, " John Harvey."

" *To Abraham Bracebridge, Esq.*

" *No.* 3, *Bridge-court, Westminster, London.*"

The whole tenor of the above letter also shows, that the subject was quite new to Mr. Harvey, and not a subject on which his mind had dwelt from 1794 in maturing plans to carry it into effect.

Whether Mr. Harvey, Jun., has acted wisely in using his father's name in the way he has done in his address to the public, and in many of his other publications, I will not now examine. In the Mechanic's Magazine, he published the following record of his father, which he introduces into his address.

" Weymouth, died on the 6th of Nov. 1829, aged 71, Mr. John Harvey, mechanic " to our late revered monarch, George the Third ; one of the first proprietors of the " Weymouth water-works ; late civil engineer of the Bootle water-works, Liverpool ; " and the original projector of the Breakwater for Portland Roads. The idea " of a Breakwater in so central a point of the British channel originated with himself " in 1794."

Whether the late Mr. Harvey was mechanic to George the Third, and one of the first proprietors of the Weymouth water-works, I know not; but I do know that he never was civil engineer of the Bootle water-works, Liverpool, nor was he the original projector of the Breakwater for Portland Roads ; and I believe the late Mr. Harvey was a man of too much good sense to have put himself forward as the civil engineer of the Bootle water-works, Liverpool, upon the basis of a letter written to him *at Weymouth ;* some time about 1804, asking his opinion on a particular point ; nor would he, *nor did he*, during his life, pretend to have projected a Breakwater in Portland Roads, in 1794, but was in 1814, after he had seen the reports in the Appendix, *surprised* that it should have been *so long overlooked.*

APPENDIX.

(A.) Albion-street, August 20th, 1813.

Sir,—In reply to your favour of yesterday, in which you request that I will, for the information of Mr. Idle, communicate to you what I know respecting Weymouth Bay, and the roadstead between Portland and Lulworth Cove, such as the depth of water, set of the tide and all other information I was in possession of, useful, in considering the practicability and utility of building a pier on such a scale as may render it a national object:—

I have to inform you, that the bottom in Portland Road is good holding ground, and that a large fleet may ride there in safety with a westerly or northerly wind; but it is not advisable for any vessel to remain there with the wind between the E. and S. S. E., because, with the wind at S. S. E., which is a dead wind on the shore all the way up and down the English Channel, it is bad riding and impossible to get out with a fleet.

It is high water about six o'clock, on the new and full moon, in Weymouth Harbour, where the tide rises eight feet, or nearly so, perpendicular. The eastern stream runs until a quarter past nine o'clock at the Bill of Portland, in the direction from the Race over the Shambles for St. Alban's Head, at a great rate, which causes an eddy in Portland Road; the western stream or tide sets the reverse of that of the eastern, and some part of it sets round the shore to Portland Bill, from whence it sets to the S. W.

I cannot state, with certainty, the depth of the water at the anchoring place in Portland Road; and I am totally unacquainted with it in Portland Bay, Weymouth Bay, and on the north shore; neither do I know of any chart that has them sufficiently correct to be depended upon.

From the present state of Portland Road, it is calculated for an anchorage only for such ships as are wind-bound, and bound down channel; but, from the exposed situation, it is a place of considerable danger.

Should a Pier or Breakwater be erected in the north-east direction, it should be built from the north-east end of the Isle of Portland, where the necessary materials are to be obtained; and if a Lighthouse be built on the north-east end of the Pier, it may be safely approached at all times; and when vessels are once within it, they will ride secure from all winds. With these advantages, vessels bound down channel (having lain there wind-bound, or otherwise,) may at any hour, when there is a fair wind, weigh anchor, and get out by night or by day, as there is no tide to hinder them, and the Lighthouse will be a leading mark to sail between the Shambles, the Island, and the Race.

Should there be an enemy's fleet lying at Cherbourg, which lies nearly south by compass from Portland Harbour 62 miles, there would be a greater chance for an English fleet meeting with the enemy, when they sail from Cherbourg, by lying at anchor in this harbour (with small vessels on the look-out), than if our squadron were cruising before the port of Cherbourg; for the enemy would naturally wait for an opportunity, when a strong gale of westerly or southerly wind should have driven the blockading squadron off their station, either up the channel, or into St. Helen's Road: then, on the shift of the wind, the enemy would sail immediately.

Should the blockading squadron have taken refuge at St. Helen's, when the wind comes fair for the enemy to sail from Cherbourg, the squadron must take a particular time of tide to get out of St. Helen's (from whence Cherbourg bears nearly W, ½ W. 65 miles), and by the time the English squadron get off Cherbourg, the enemy's fleet may be so far down channel as not to be overtaken; whereas, should the blockading squadron remain at anchor in Portland Harbour, the ships might always be kept completely victualled and watered, have less wear and tear, be ready to sail at any time, and are further down channel than Cherbourg. Should a ship or a fleet bound up the channel, be taken with a gale of wind to the north-east or eastward, and not be able to get the Needles' passage, they would be obliged to bear up either for Dartmouth, Plymouth, or Falmouth, or lay to and drive down the channel; but if a Pier or Breakwater was built at Portland, they would of course put in there. With a Pier or Breakwater at Portland, the advantage to the port of Weymouth and Portland would be incalculable, as they might then load their vessels with Portland stone, with any wind; and as they are now confined to the size of their vessels, for the want of more water in Weymouth Harbour, they might then have what size vessels they please, and carry on not only the coasting, but any foreign trade they please.

Should Government think it advisable to lay moorings down within the Pier or Breakwater, ships riding there, with the moorings taken in at the Starboard Briddle Port, when ordered to sail, would cant to port, be under sail in a quarter of an hour and fetch out in one tack, even with a south-east wind, by night or by day. I am, Sir, yours, etc.

To Alexander Lamb, Esq. JOSEPH DESSIOU.

(B.)

Newington, October 12, 1813.

Sir,—On the 29th ult. I proceeded to Weymouth to ascertain the practicability, utility, and expense of the proposed reef or breakwater, from the north-east extremity of the Isle of Portland, and thorough investigation affords me the pleasure of reporting that the intended undertaking is in all respects practicable. The situation is highly favourable by nature, and the work itself will be facilitated by fortuitous facts relative to the stone, of extraordinary novelty, and equal worth.

The foundation is good, being a hard bluish clay, on which the stones will not slip or move, but slightly bed themselves, and remain for ever stationary.

The depth of water averages 8½ fathoms at the *highest* tides, including 8½ feet the rise of the tide. This depth is less than exists in a similar undertaking. The dyke or mole of Cherbourg, which was formed in 10 fathoms water low spring tides, and which tide rises there 6 fathoms; to which height the French have not only erected the work, but also to 5 fathoms more, making the total elevation 21 fathoms. This exceeds the proposed reef or breakwater by 12½ fathoms. The Portland breakwater will be about 1½ fathoms less deep than that in Plymouth Sound at *high water;* and while Plymouth only accommodates thirty-six ships of the line, Portland harbour will give equal berth and room to sixty sail of the line, besides a far more extensive and sheltered space in the wake of the breakwater for frigates and whole convoys.

In reference to the above sixty sail of the line, it should be observed, that not less than 5 fathoms low water is allowed to each vessel; while it appears that, by the plans and papers printed by order of the House of Commons, relative to Plymouth Sound, that no more than 4⅘ is in some instances afforded there to ships of the line; yet much of the anchorage ground for these ships in Portland proposed harbour will exceed 9 fathoms.

Here there is no danger of ships "striking on their own anchors," or those of "ships lying near them," "in the event of driving," or "in the act of unmooring;" neither will it be possible for "large men of war" ever "to strike on the bottom," or "drag their moorings." The surface sheltered by the breakwater of Plymouth, is about 1¾ superficial miles; but the proposed Portland harbour will contain a tranquillised sheet of water of full 4 miles area.

The tide in Plymouth sound rises 18 feet, and runs 1½ knots per hour; but in Portland Roads it only rises 8 feet, and never runs strong. Owing to the embayed position of the place the tide forms an eddy; hence it is generally said by seamen to have no velocity of tide, though in reality it has some, but not worthy of notice. Thus neither rapidity nor altitude of tide equal the difficulties that in other instances ourselves or our enemies, have surmounted.

The local facilities that promote the execution of this great work next claim attention.

The stone is ready quarried, and lying in many millions of tons within one mile of the proposed breakwater. Favourable localities do not end here; the required stone lies at such an altitude, that the descending laden waggons will draw up the empty or light ones, and human or horse labour need scarce be exerted. It may be had in dimensions far greater than requisite, and the abundance is such as to admit the utmost latitude of choice. Stone has been wrought in, and transported from, the Isle of Portland for about 200 years. The number of quarry-men at present employed exceed 450. The quarries are in general placed at least 250 to 300 feet above and very close to the sea shore.

The most advisable mode of constructing the proposed breakwater, is by large stones, cautiously placed in the sea-line of deposition, being directed by marks and mooring chains previously and correctly situated, and superintended by a skilful person, who will point out to each vessel its particular spot for each unloading. This chiefly relates to the casing of the breakwater, for the interior of which stone of a less dimension will be adequate. None, even in the casing, need be larger than 1½ to 2 tons, yet, as stated before, they may be had in any quantity, and of any dimensions.

A breakwater of 2 miles long will be fully sufficient to shelter his Majesty's fleet, and the largest convoys that ever assembled on the coast. It does not occur to me as requisite to form a cut-stone pier along the breakwater in the first instance; but a lighthouse, at the north-east end, will be useful. As the work proceeds, the efficiency of its protection will be ascertained: at present I am of opinion, that 1½ miles is the utmost length to which it need be extended.

By deflecting the last quarter of a mile of the Breakwater, as represented on the plan, the send, swell, or waves, during a south-east wind, will be materially reverberated, or thrown off, and thereby more fully protect the entrance of the harbour.

My estimate is subjoined. The facilities appertaining to the stone have naturally and materially reduced the total expense which would (considering the magnitude of the work) otherwise appear deficient. The calculation of quantity is formed on slopes and angles equal to the Breakwater at Plymouth (which admirable and well-executed work has already produced beneficial effects), and is more than I have seen allowed in very ancient sea-mounds or dykes in Holland. Some deductions may take place during the progress of the work, yet it is right to allow to the utmost in the first estimate.

It does not appear possible, that the Breakwater will ever have within it a decreased depth. There are not any rivers, as at Plymouth or Cherbourg, to deposit their silt or sediment; and when the tide runs out of the harbour of Weymouth, it will be at the same time *running out* of the new harbour of Portland: therefore, the sediment of the Wey, trifling as it is, cannot *run into it*, as the *lower* level will always be near the mouth of each harbour.

The Fleet, or little armlet of the sea, that stretches between the Main and Chesil Bank, disembogues, on the ebb, very little more than it receives on the flood; and the little it does contribute, when the new harbour is made, will scour the north shore, and have a good effect.

These confluent waters having a narrowed channel to pass through near the entrance of the new harbour, it may in time be somewhat deepened, but cannot be lessened.

The limited compass of this paper compels me to close these remarks, and proceed briefly to express my sentiments of the utility of this great work.

The French, rightly observing that England has no intermediate harbour between Plymouth and Spithead for her navy, have wisely made an artificial one for themselves, almost opposite Portland, and nearly midway between the above harbours. They have constructed the dyke or mole of Cherbourg, at an immense expense, for the reception and defence of their navy. Hence it becomes even the political interest of Great Britain to create a harbour that may counteract the designs and capabilities of the enemy: for this purpose, Portland Roads naturally present themselves, where nature has done nearly all that is required, and aided by the circumstances mentioned of the stone, the cultivating hand of Englishmen alone is needed to improve and turn these blessings to their own benefit and protection.

A national harbour in Portland Roads will effectually counteract all mischief from the enemy. The distance is so moderate between Cherbourg and Portland, that, generally, signals of the course of the enemy may be received in half an hour. Whenever an enemy's fleet leaves Cherbourg, they must stand considerably out into the channel; and the British fleet would rarely, if ever, be more than two or three hours astern of the enemy. The south-east and easterly winds are those that render Portland Roads at present an insecure anchorage; a Breakwater extending to the north-east, as laid down in the plan, will be an effectual shelter—ships may then run into the harbour, or get out to sea, *at all times* of tide, and *with all winds*, when they can carry sail. Here. the narrowest entrance channel is nearly two miles; but the *broadest* at Plymouth will be only half a mile. At Portland, the holding ground is the *best possible*; being a hard clay. Here, there is no under-swell or recoil of the waves from the shore; ships at anchor will ride end on and steadily; the nearest *lee shore will be about two miles from the end of the Breakwater.*

I prefer the Breakwater to unite to the island rather than be in any other situation—the accommodation will be greatest, and the expense least. Portland Harbour has not "shovel," "tinker," or "panther" rocks, in mid-channel or *anywhere*, like Plymouth Sound; but all is clear, deep, open, and extensive, presenting the largest and most safe artificial harbour in Europe; greatly exceeding Cherbourg, and the recent harbours made at Averio, in Portugal, and still more so that of Ramsgate, which does not admit ships of war, although it has cost more than the suggested national harbour of Portland will cost.

At this time, Weymouth Harbour cannot receive large ships; even their colliers are obliged partly to unload in the Roads, where they are much exposed, and the expense is great.

The neighbourhood offers ample sites for docks, and every accommodation that the navy or army may in future require, with water and provisions abundant and cheap. Not only the commerce of Weymouth, and the trade of Portland, but the coasting trade in general, and the East and West India trade in particular, will be much benefited by this great improvement. The most intelligent maritime inhabitants assure me, that had this Breakwater existed, the Abergavenny and Halsewell East Indiamen and crews would not have been lost; and the greater part of Admiral Christian's fleet and the army would have been saved. To say nothing of the valuable lives that perished, the property of and in the Abergavenny alone, was equal to the whole cost of this political as well as humane improvement.

Viewing the Isle of Portland for a military station, it possesses all that science can desire of nature to give. It is prominent in the channel, and central to a long line of coast, and is probably the only place in England that, at a moderate expense, can be equally well fortified; and its guns would effectually cover the new harbour. Being united to the main by a very narrow isthmus, it has a fine military advantage.

This isthmus lies full 400 feet under the crest of the island, and within a short range of shot. The landing-places are few, and easily defensible.

As a depot for recruits, its utility is supposed to exceed the Isle of Wight, where the opportunities of desertion are numerous, and the great population of the place may tend to impede discipline.

It has been suggested, by an intelligent gentleman, that Portland is well calculated as a depot for prisoners of war. The recruits themselves would form a most useful, if not the major, part of the requisite garrison. To escape appears impossible, with the least preventive caution; and the smallness of the required garrison would leave many troops disposable that are now unavailable. The intended piers used in forming the work, will admit transports to lay them alongside, and thereby increase the rapidity, and decrease the expense of embarkations; while the facility of getting to sea from this harbour will enable troops to be readily sent to any part of the world.

I have the honour to be, Sir, yours, &c.
(Signed) GEORGE DODD.

Estimate of the proposed Portland Reef or Breakwater.

To 3,500,000 tons of Portland or roach-rough stone, placed in the reef at 3*s.* 6*d.* per ton	612,500
To railways, waggons, and machinery, of every requisite description	20,000
To six stone shipping piers	7,200
To mooring chains, anchors, buoys, and stationary vessels	7,000
To a lighthouse at the north-east extremity of the reef	4,000
To contingencies 20 per cent. on the estimate	130,140
Estimate for 2 miles	£780,840
Ditto of only 1½ miles	£585,630

Oct. 25, 1813. GEORGE DODD, Engineer.

(C.)

London, October 11, 1813.

Sir,—Portland Bay appears to me to be the only place in the British Channel, from Spithead to Plymouth, capable of being made a good harbour for men-of-war and merchant-ships. Its advantages are many : 1st. Its shelter for cruisers, particularly so, should it be necessary at any time to watch or blockade Cherbourg. 2nd. The bottom is all good holding ground, being blue clay; and the Bay is quite clear of rocks and shoals. 3rd. There is little or no stream of tide in it, as it is mostly eddy. 4th. It is an excellent outlet for ships bound up channel or to the north sea. 5th. It will also be an easy outlet down channel, as ships will mostly fetch out in two tacks—what cannot be said of any other port in the British Channel, with the wind blowing in.

The mole or pier proposed to be made in Portland Roads (if accomplished so as to make smooth water there), will be of great national advantage for the above reasons ; and also that ships will be able to ride there safe with any wind ; now they can only be there with a westerly and northerly wind, and even then in constant fear of a sudden shift to the southward or eastward, as with either, if it blew strong, ships could not get out, and of course would be in danger of going on shore. Had there been a good harbour at Portland, the following dreadful disasters might have been prevented: viz. The great loss sustained by Admiral Christian's fleet in the year , and the ruin of the expedition he was then going on—the loss of the Abergavenny, and the loss of the Halsewell East Indiaman, with, no doubt, many others. The advantages of the above mole or pier in Portland Roads appear to me to be as follows :—

1st. Ships sailing from Plymouth with the wind at S.E. by S., must work out at least 5 miles, and then they cannot clear the Lizard Point, as the western stream will draw them into the Bay for 3 hours after low water.

2nd. Coming out of Portland with the same wind, you have to work 4 miles out, and then you fetch 21 miles to the southward or windward of the Ramshead off Plymouth, and can continue your course down the channel, if you wish.

3rd. Ships bound westward are expected to sail from any port of the British Channel with the wind at S.E. ; therefore ships sailing from Plymouth with this wind will fetch within 49 miles off Ushant; ships sailing from Portland will fetch within 11 miles off Ushant.

4th. Ships cruising off Cherbourg could put into Portland, victual and water in one day, when it would take them several days to go to Spithead or Plymouth, allowing they had fair winds there and back.

5th. Ships can sail from Portland with the wind at S.S.W. for any port up channel or the North Sea ; with the same wind at Plymouth they must work out at least 12 miles, before they can stand to the eastward, but should the wind blow strong they cannot get out of Plymouth at all, not even with the wind at S.W. It also takes a whole tide to work out of Plymouth; and then the stream runs to the westward for three hours against them. Ships could work out of Portland at any time of tide, but with the above wind they could sail out by day or night.

6th. Ships watching off Cherbourg, should the wind blow easterly, must run for Plymouth, and they cannot return with that wind. Should it shift to the westward, say S.W., and blow strong, they cannot get out of Plymouth to return to their station ; at the same time they could have run for Portland with an easterly wind, and return to their station as soon as the wind moderated ; and they could also return from thence with the wind at S.W.

7th. Watching the same port with a strong wind westerly, you can run for Portland, and come back with the same wind to your station with pleasure. You can also run for Spithead, but cannot return with the same wind ; and when the wind shifts to the eastward, should the tides fall out late and early, you cannot get off Cherbourg in less than 24 hours ; when from Portland you can run over in 6 hours athwart your enemies' bows (if they are out), instead of chasing after them from Spithead some hours' sail astern.

8th. When your ships are blown off their station, and forced to Plymouth or Spithead, the ships in Cherbourg can put to sea, for up or down channel, and be out of your reach before you have intelligence of them.

9th. It will take a much longer time to communicate with Plymouth or Spithead than with Portland, should an enemy's fleet be preparing to come out ; and with an easterly wind you cannot communicate with Spithead at all ; with a westerly wind you cannot communicate with Plymouth, but with either you can with Portland.

10th. Cruisers will maintain their station much longer in gales of wind, when they know they have a safe harbour to run to by day or night, which is of great importance, as in that time of perseverance the wind may abate, and the ships not leave their stations at all.

11th. Ships running out of Portland to the westward have a good channel between that isle and the Shambles, about 1½ mile wide, and from 6 to 12 fathoms deep. Fleets of men-of-war and merchantmen have passed this channel.

12th. Ships bound down channel, caught in a western gale, run for the Isle of Wight. Night coming on, strangers would be obliged to bring to; before morning they drift by, after which they must run for the Downs. These ships would have been off Portland by day-light, and could have been in had there been a harbour.

13th. Many ships have also been off Dunnose, caught in a gale of wind to the eastward, and obliged to run for Plymouth, when a sudden shift to the S.W., blowing strong, kept them there ; they could not return till it was moderate ; had they a safe harbour at Portland, they could have been in and out as soon as the wind shifted.

14th. The French have, of course, built their pier at Cherbourg to annoy our channel fleet, should they ever have it in their power. And suppose they had thirty sail of the line in the above port, and we had twenty sail in Plymouth, and twenty sail in Portsmouth, they could not join, and the French would be able to beat or disable either at their will; in fact, they might be said to blockade these fleets lying in their own harbour.

The foregoing articles are all subject to revision, as they have been gone over rather hastily, but I have consulted Mr. Dessiou on the whole, and have his entire approbation of the particulars ; indeed, we have spent some hours together since you left town.

I am, Sir, your most obedient servant,

To Christ. Idle, Esq., M.P. SAM. WATKINS.

(D.)

Alban-street, Dec. 9th, 1813.

Sir,—I duly received your letter, communicating Mr. Idle's desire to be correctly informed respecting the depth of water on the north side of Weymouth Bay, the width and depth of the channel between the Shambles and Bill of Portland, the depth of water within the proposed Harbour, together with its capability of containing any number of His Majesty's ships of the line, and requesting me to proceed thither, in order to procure the requisite information for Mr. Idle's government.

Immediately on receiving these instructions, I proceeded to Weymouth; and on the 31st. October, Mr. George Dodd, the engineer, and Mr. Watkins also arrived. On the ensuing day, we commenced surveying Weymouth and Portland Roads, and the whole line of coast connected with the proposed Breakwater. The next day (the weather being favourable) we continued our soundings on an extensive and accurate scale, which are delineated on the plan I have the honour herewith to transmit for Mr. Idle's information.

In my last communication to you, I stated I was not personally acquainted with the precise soundings ; but now I am enabled to report that they are more than adequate for the reception of His Majesty's ships of the line, and vessels of all other descriptions: and, in my opinion, a Breakwater two miles in length, will perfectly shelter and protect sixty ships of the line, besides numerous other smaller vessels.

I think the proposed Harbour one of great national utility; and from what I have locally observed, I am convinced that its completion will be attended with no difficulty.

When the Breakwater is finished, ships will not be liable to drive or drag their anchors, and owing to the depth of water, never can strike on the anchors of other vessels near them.

Every ship will ride in safety in tempestuous weather, and may proceed to sea with all winds, and at any time of tide, by night or day.

The fine, deep, and spacious Bay on the north side, leading into the proposed Harbour, without any one rock or shoal, are such favourable circumstances as do not exist in any other place in Great Britain; and the entrance being 1¾ miles broad, into a Harbour of 4 miles surface, is nowhere equalled. Therefore, after my survey, and on a full and mature consideration of this subject, it is my opinion that the proposed Harbour is practicable, and will be of essential service to His Majesty's navy, and the general shipping interest of the kingdom.

I cannot close this letter without apprising Mr. Idle of what you were in part a witness of, the very ready and able assistance I derived from Mr. Harvey, of the Library at Weymouth, who appears to have bestowed much thought and consideration on the subject, and who communicated much useful local information.

I am, Sir, yours, etc.

To Alex. Lamb, Esq, JOSH. DESSIOU.